

CLAIMS

1. A filter device for the depletion of the leukocyte content from blood products comprising a housing with an inlet and an outlet port and, within said housing, at least two porous elements adapted for removing leukocytes, each porous element comprising one or more layers of filtering material, wherein said at least two porous elements have a different hydrophilicity, characterized in that the said porous elements are arranged in the filter device so that the first element has a higher hydrophilicity than the successive filter element(s) in the direction of flow, from inlet to outlet, of the blood product through the filter device.

2. A filter device according to claim 1 comprising more than two filter elements for leukocyte depletion, characterized in that any given filter element has a higher hydrophilicity than its successive filter element in the direction of flow of the blood product through the filter device from inlet to outlet.

3. A filter device according to claim 1 or 2 wherein each porous element comprises at least two adjacent layers of filtering material.

4. A filter device according to claim 3, wherein said at least two layers of filtering material are made of the same material having the same hydrophilicity properties.

5. A filter device according to claim 3 or 4, wherein said at least two layers have a decreasing pore size from inlet to outlet.

6. A filter device according to any of claims 1 to 5, wherein any given porous element is made of a filtering material having a pore size higher than the pore size of its successive porous element.

7. A filter device according to any of claims 1 to 6, wherein said porous elements are made of fibers of a polymeric material selected from the group consisting of polyester, polyolefines, polyamide and polyester, polyolefines or polyamides coated with a hydrophilic polymer and mixtures of said fibers.

8. A filter device according to claim 7, wherein said hydrophilic polymer is selected from the group consisting of hydrophilic acrylic polymers or copolymers and hydrophilic polyurethane.

9. A filter device including at least a first porous element made of layers of polybutylterephthalate fibers coated with a hydrophilic polymer or copolymer and a second porous element made of uncoated polybutylterephthalate or polypropylene layers.

10. A filter device according to any of the preceding claims comprising two or more porous elements for leukocyte depletion made of one or more layers of filtering material, wherein said porous elements are arranged in the filter device according to a decreasing value of the CST or CWST of the constituting material, from inlet to outlet.

11. A filter device according to any of the preceding claims

wherein the difference between the hydrophilicity of the inlet porous element and the final outlet porous element, as measured by the value of the CST or CWST of the constituting material is of at least 10 dyn/cm.

12. A filter device according to any of the preceding claims, wherein the difference between the hydrophilicity of the inlet porous element and the final outlet porous element, as measured by the value of the CST or CWST of the constituting material is of from 10 to 20 dyn/cm.

13. A filter device according to any of the preceding claims wherein the first inlet porous element is made of material having a hydrophilicity as measured by the CST or CWST of the constituting material higher than 63 dyn/cm.

14. A filter device according to any of claim 1 to 8 comprising within said housing one or more additional filter elements of any hydrophilicity which are not adapted for leukocyte removal (e.g. gel filtration elements or microaggregate filtration elements).

15. A filter device according to claim 14 wherein said filter elements not adapted for leukocyte removal are located closer to the inlet than said elements adapted for leukocyte removal.

16. A blood bag device for the separation of blood into leukocyte depleted blood components comprising at least a first bag connected, in fluid flow communication with a second bag through a leukocyte filter device according to any of claims 1 to 13.

17. A method for the leukocyte depletion of blood products comprising feeding said blood product through a filter device according to any of claims 1 to 14.

18. A method according to claim 17, wherein said blood product is selected from the group consisting of whole blood, platelet-rich plasma, packed red cells, platelet concentrate and plasma.